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When you think of cross contamination within a food factory, the air distribution system is not normally the first point of call. Nevertheless, incorrect air flow and insufficient air filtration means that the air within a facility can act as a source of contamination by moving contamination from other sources within the processing area.

Effective air filtration, and a good level of air hygiene is not only important to ensure a safe and comfortable working environment, but it is also essential to reduce or prevent the possibility of airborne contamination in High Care and High Risk Areas.

High Care & High Risk Areas

All food manufacturing and processing facilities require efficient air filtration and effective extraction and ventilation, and it is necessary to ensure the air flow containment of these critical working areas.

There is a considerable amount of information available in relation to management of High Care and High Risk environments in food manufacturing. However, a large proportion of these are focused around the production equipment layout, physical contamination, cleaning and hygiene in specific areas. Most food quality standards and regulations give little guidance on air flow, ventilation and air filtration between High Care and High Risk environments.

Requirements for Audit Compliance

Food hygiene and contamination assessments take up a large portion of a manufacturer's food audit. It is a HACCP legal requirement for food processing facilities to effectively manage microbiological and cross contamination. Since the air flow within a facility can act as a source of contamination, air hygiene management and air mapping are therefore central to food audit compliance.

Documented Inspections

Manufacturers are required to have a programme of documented hygiene and fabrication based inspections performed on High Care and High Risk Areas. Differing from the internal audit programme, these inspections assess the standards of cleaning, equipment, building fabrication and personal hygiene to ensure that high standards are maintained and a safe hygienic production environment is in place.

These audits will involve the critical examination of the procedures and arrangements in place to ensure that potential risks for contamination in High Care and High Risk Areas have been addressed. This includes the air hygiene management and the air mapping of the environments. Therefore, it is crucial to understand the required levels for audit compliance.

Air Handling Requirements in High Care & High Risk Areas

High Care Areas – Reducing Contamination

The BRC standards state that:

"High care areas require high levels of hygiene, working practices, fabrication, design of facilities and equipment to ***minimise*** *product contamination with regard to microbiological hazards. Products produced in high care areas will have undergone a process to reduce any microbiological contamination prior to entering the high care area."*

But what does this mean for the air flow and ventilation in High Care Areas?

It means that the air supply and air distribution will play a significant role in

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reducing the risk of airborne contamination and recontamination. The flow of indoor air within the high care environment needs to be effectively mapped to minimise contamination.

Although many retailers normally look for a minimum of 0.5m/s airflow from Low Care through to High Care, with regards to the BRC Standards, there are no specific requirements for air over pressure in High Care Areas. However good manufacturing practice does require a good level of air filtration and a balance in the ventilation system. In addition, other accreditation schemes and governing regulations may have regulations in place with regards to the air over pressure.

As the High Care areas carry less risk than that of High Risk Areas, the air handling and filtration in High Care Areas is generally easier to manage.

High Risk Areas – Preventing Contamination

The BRC standards state that:

"High risk areas require the highest levels of hygiene, working practices, fabrication, and design of facilities and equipment to ***prevent*** *product contamination with regard to microbiological hazards."*

Again, what does this mean for the air flow and ventilation in these High Risk Areas?

The air supply and air distribution in High Risk Areas will play a critical role in preventing the risk of airborne contamination.

The BRC standards also state that food manufacturing facilities are required to meet specific requirements for air handling in High Risk Areas. The Standard requires that:

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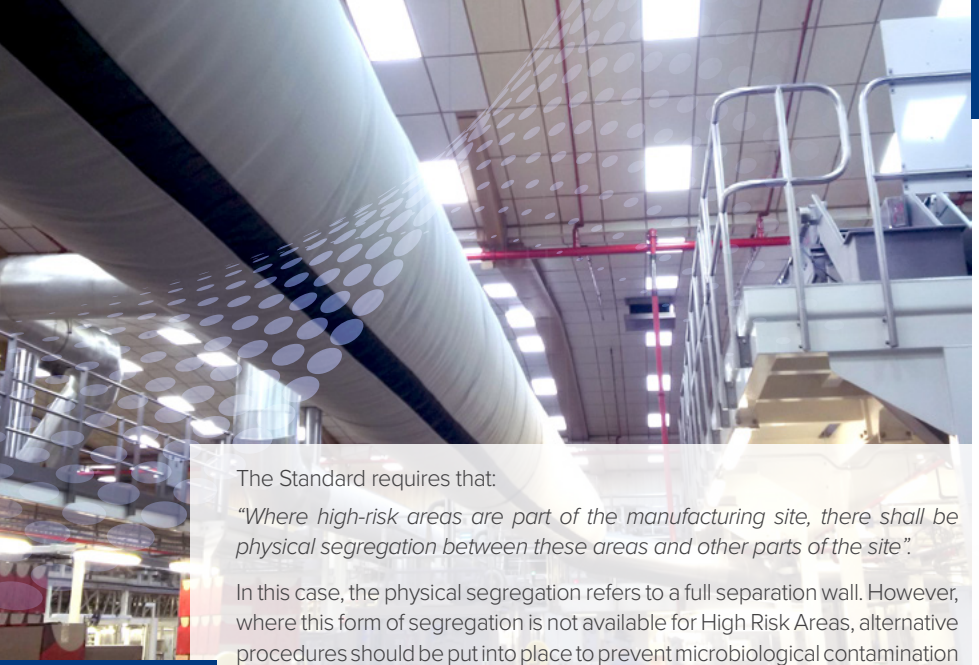
HVDS
www.hvds.co.uk
sales@hvds.co.uk
01785 256 976



The Standard requires that:

"Where high-risk areas are part of the manufacturing site, there shall be physical segregation between these areas and other parts of the site".

In this case, the physical segregation refers to a full separation wall. However, where this form of segregation is not available for High Risk Areas, alternative procedures should be put into place to prevent microbiological contamination from airborne particles. This may include time or space separation, control of movement or other restrictions. No matter what alternative procedure is employed, the method must be validated to demonstrate controls are effective in preventing cross contamination.

Air Filtration and Ventilation for High Risk Areas

The management of air filtration within High Risk Areas is crucial to ensure that the air introduced does not contain micro-organisms of concern and not be the source of additional contamination.

There are certain aspects that need to be considered to maintain the recommended and required levels of ventilation, extraction and filtration of the air in the High Risk environments:

- To establish the air quality standards that are required, it is important to carry out a hazard analysis (HACCP).
- Air intake (fresh air supply) needs to be located to minimise the intake of contaminated or re-contaminated air, for example upwind of potential contaminants such as dust and chemical vapours.
- A documented risk assessment must be conducted to determine the requirement for air filtration.
- There is no 'universal' standard for air filtration, however, the filter grade required will depend on the source of the air and the period of exposure to high risk products and ingredients. Some accreditation schemes and governing regulations may have regulations in place with regards to a required grade of filtration.
- The effectiveness of the filter and system employed should be checked by the use of periodic sampling of the air, close to the outlet of the air ducts for microbiological quality.
- The air filter replacement frequency is just as important as the air filter specification. The build-up of dust, dirt and grease on air filters in the air handling system can result in recirculation of contaminated air.
- Without regular cleaning, air will pass through the polluted duct carrying bacteria onto or around the food process areas, it is important to maintain a routine air duct and air handling cleaning schedule.
- Maintaining positive air pressure compared to adjacent areas, particularly where there is a connection with low risk areas.

Managing Contamination to Protect Consumers and the Industry

Over the last decade, the food industry has seen a rapid evolution of food safety regulations. Many food manufacturers have had to make significant

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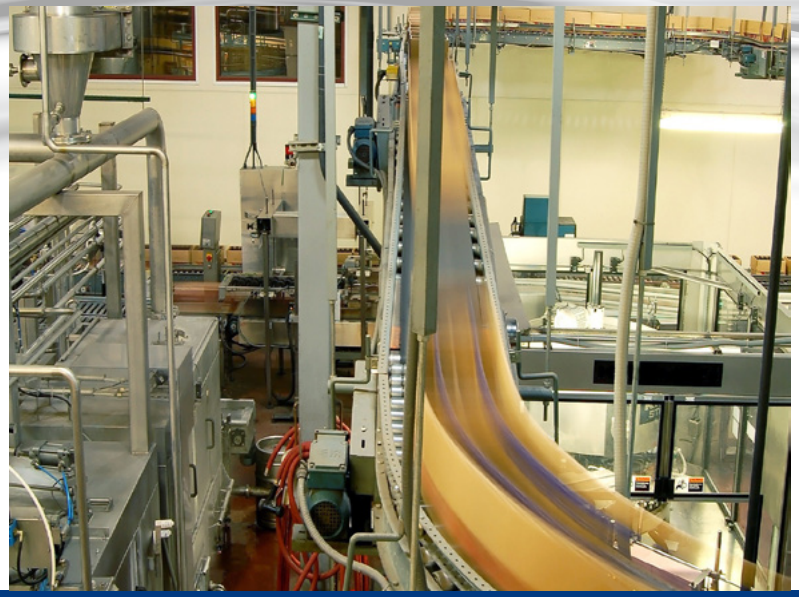
developments to processes, procedures and resources to remain compliant with regulations.

As a result of changing consumer habits and as rise in the demand for specially manufactured dietary foods, there is a continued growth in the 'types' of food manufacturing and processing facilities that we are seeing in the food industry. In many cases, each manufacturing process is different and requires a unique layout and organisation of a facility, which is centred around the specific production output.

Although this proves to benefit the consumer and reassures manufacturing quality, it does however mean that it isn't easy to provide a 'universal' solution for individual air hygiene and air handling requirements. On the other hand, it can be simplified, and overall the requirements for air handling in High Care and High Risk Areas can be defined to:

The inbound or fresh air supply into High Care and High Risk Areas needs to undergo sufficient filtration to reduce or prevent the risk of airborne contamination. And the air extraction mapping of the potentially contaminated air that is produced within the High Care and High Risk areas is filtered and distributed in a way that will help prevent cross contamination.



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The food manufacturing industry have recommended HVDS for its products, services and advice. As a result we have become a **'Trusted Partner in Clean Air'** to the Food Manufacturing industry.

If you require more details about managing the air in your High Care and High Risk Areas please **contact us.**

HVDS
www.hvds.co.uk
sales@hvds.co.uk
01785 256 976